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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,294	08/17/2001	Hormuzd M. Khosravi	884.436US1	4878

21186 7590 08/07/2006

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EXAMINER

RYMAN, DANIEL J

ART UNIT	PAPER NUMBER
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2616

DATE MAILED: 08/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/932,294

Applicant(s)

KHOSRAVI ET AL.

Examiner

Daniel J. Ryman

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11, 12 and 14-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3, 5, 6 and 8 is/are allowed.
- 6) ☒ Claim(s) 4, 7, 11, 12 and 14-30 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12 July 2006 have been fully considered but they are not persuasive regarding claims 11, 12, and 14-30. On page 10 of the Response, regarding claims 16-21, Applicant asserts that "Applicant is unable to find in Prince 'applying a switch-label to at least one packet, wherein the packet is in accordance with Open System Interconnect [OSI] communication model.'" Examiner agrees that Prince does not expressly disclose that the packet is in accordance with the OSI model; however, Prince does disclose that the packet is in accordance with ATM (col. 6, lines 60-62), where it is implicit that ATM is in accordance with the OSI model (see Civanlar: col. 1, lines 20-21). As such, Examiner maintains that the cited prior art anticipates claims 16-21.

2. On pages 16-18 of the Response, regarding claims 11 and 14, Applicant asserts that Prince fails to disclose "adding a switch-label corresponding to an actual egress interface to the table, when an egress-port is not present in the forwarding element, wherein the switch-label is unique for every port/next-hop pair on the router." As outlined in the previous rejection, and below, although Prince fails to expressly disclose the aforementioned limitation, Prince does disclose that switch labels (routing tags) are only used when the egress-port is not present in the forwarding element (col. 14, lines 40-45). In addition, Prince discloses that each forwarding element has a routing table (col. 9, line 57-col. 10, line 8), which includes switch labels (col. 10, lines 3-8), and that this table is updated (col. 6, lines 6-11). Thus, Prince discloses (1) that the switch labels are used only when the egress-port is not on the forwarding element; (2) that every forwarding element has a routing table; and (3) that the routing table includes switch labels.

Therefore, it is implicit, or at the very least obvious, that a switch-label corresponding to an actual egress interface is added to the table when the egress-port is not present in the forwarding element since a switch-label is only used when the egress-port is not on the forwarding element where the switch-label is included in the routing table.

3. On pages 18-19 of the Response, regarding claims 12 and 15, Applicant asserts that Prince fails to disclose “performing no altering of the routing table for a forwarding element, when an egress-port is present in the forwarding element.” As outlined above, Prince discloses that the system will use a switch-label, which is included in the routing table, when the egress-port is not on the forwarding element. The converse of this is that Prince does not use a switch-label when the forwarding is done intra-forwarding element, such that no modification of a routing table to add switch-labels is required in this instance.

4. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Prince discloses that the routing tables are updated (col. 6, lines 6-11). Therefore, one of ordinary skill in the art at the time of the invention would have been motivated to add the switch-labels to the routing table in accordance to whether the egress-port was on the forwarding element in order to ensure that the routing table reflects the updated list of routing tags.

Art Unit: 2616

5. In view of the foregoing, Examiner maintains that claims 11, 12, 14, and 15 are obvious in view of the cited prior art. Although Examiner indicated that claims 11, 12, 14, and 15 were rejected under Prince and Jennings, Examiner only rejected claims 11, 12, 14, and 15 under Prince. Since the mistaken inclusion of Jennings did not affect the substance of the rejection, Applicant was able to adequately address the rejection. Therefore finality is proper.

6. On pages 19-21, regarding claims 22 and 25, Applicant asserts that Andersson fails to disclose “a rout [sic] look-up table to contain addresses associated with the packets entering the forwarding elements, and a switch-label entry table in each of the forwarding elements to contain labels associated with the packets transferred internally among the forwarding elements via the switched interconnect/backplane.” Examiner, respectfully, disagrees. Applicant admits as prior art a plurality of forwarding elements coupled to a switched interconnect/backplane (page 2, lines 20-21), each of the forwarding elements to maintain a route lookup table to contain addresses associated with the packets entering the forwarding elements (where each FE performs route look-up, page 2, lines 10-14, and where route-lookup is performed using route look-up table containing addresses, page 1, line 30-page 2, line 6). Thus, Examiner maintains that Applicant admits as prior art “a route look-up table to contain addresses associated with the packets entering the forwarding elements.

7. In addition, Andersson discloses having a switch-label entry table in each of the forwarding elements containing labels associated with the packets transferred internally among the forwarding elements via the switched interconnect/backplane (col. 3, lines 17-38, where the tagging unit applies a switch-label, i.e. SPAS, to each cell passing through a forwarding element via a switched interconnect/backplane). As such, Examiner maintains that Andersson discloses a

Art Unit: 2616

switch-label entry table in each of the forwarding elements to contain labels associated with the packets transferred internally among the forwarding elements via the switched interconnect/backplane.

8. In view of the foregoing, Examiner maintains that claims 22-30 are obvious in view of the cited prior art.

9. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Andersson discloses using a switch-label in a switching system in order to reduce the number of internal control paths required (col. 3, lines 60-63).

10. In view of the foregoing, Examiner maintains that claims 11, 12, and 14-30 are obvious in view of the cited prior art.

Claim Objections

11. Claim 11 is objected to because of the following informalities: in line 3, "the router" should be "a router", and, in line 4, "the forwarding element" should be "a forwarding element". Appropriate correction is required.

12. Claim 12 is objected to because of the following informalities: in line 3, "the router" should be "a router", and, in line 4, "the forwarding element" should be "a forwarding element". Appropriate correction is required.

Art Unit: 2616

13. Claim 14 is objected to because of the following informalities: in line 3, "the routing table" should be "a routing table"; in line 4, "the forwarding element" should be "a forwarding element"; and, in line 6, "an egress-port" should be "the egress-port". Appropriate correction is required.

14. Claim 15 is objected to because of the following informalities: in line 3, "the routing table" should be "a routing table"; in line 4, "the forwarding element" should be "a forwarding element"; and, in line 6, "an egress-port" should be "the egress-port". Appropriate correction is required.

Claim Rejections - 35 USC § 112

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16. Claims 4 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

17. The term "local" in claims 4 and 7 is a relative term which renders the claim indefinite. The term "local" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Previously, Examiner rejected claims 4 and 7, as being indefinite, since claims 4 and 7 required a packet to be received and forwarded from a single forwarding element, where claims 1 and 6, which claims 4 and 7 depend upon, respectively, required that various steps be performed "before the packet is transferred to a switched interconnect/backplane of the router." Simply, the various steps could not be performed "before

the packet is transferred to a switched interconnect/backplane of the router” if the packet is never transferred to a switched interconnect/backplane of the router. In this instance, “local” was defined to be “on the ingress forwarding element.” Applicant has subsequently deleted this definition of “local” from the claims in an attempt to overcome the previous rejection. Currently, it is unclear what constitutes a “local port.” Examiner suggests amending claims 4 and 7 to reinstate the deleted language and amending claims 1 and 6 from “performed before the packet is transferred to a switched interconnect/backplane of the router” to “performed on the ingress forwarding element before the packet is forwarded to another port” or something similar. In any case, Examiner requests that Applicant provide evidence of support in the Specification for any amendments.

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19. Claims 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Prince et al.

(USPN 5,852,606), of record, in view of Civanlar et al. (USPN 5,828,844).

20. Regarding claims 16 and 19, Prince discloses a method to switch at least one internal packet comprising: applying a switch-label (routing tag) to at least one packet, wherein the packet is in accordance with Open System Interconnection communication model (where Prince discloses the use of ATM, see col. 6, lines 60-62, and Civanlar teaches that “ATM is a protocol that resides at layer two of the OSI model,” col. 1, lines 20-21), wherein the switch-label is

Art Unit: 2616

generated upon receipt of the packet (col. 13, lines 42-46 and col. 14, lines 57-59), wherein the switch-label uniquely identifies an address within a router in which the address is an address of a port/next-hop on an egress-forwarding element within the router (col. 14, lines 57-64), wherein the egress-forwarding element is one of a plurality of forwarding elements within the router (Fig. 3 and col. 9, lines 29-38), wherein the forwarding elements are operably coupled to each other through a transfer connection (Fig. 3 and col. 9, lines 29-38); and wherein the transfer connection is selected from the group consisting of a single bus, and a switched backplane/interconnect (Fig. 3 and col. 9, lines 29-38); and transferring the packet between the plurality of forwarding elements via the transfer connection, wherein the switch-label is applied to the packet before the packet is transferred to the transfer connection (col. 14, lines 57-64).

21. Regarding claims 17 and 20, Prince discloses that the applying is performed by an ingress forwarding element (col. 14, lines 57-64).

22. Regarding claims 18 and 21, Prince discloses receiving the packet (col. 14, lines 39-64); removing the switch-label from the packet (col. 14, lines 39-64) where it is inherent that the switch-label is removed; completing layer-2 encapsulation (assembling the Ethernet packet) of the packet in reference to an external network (col. 14, lines 39-64); and transmitting the packet, wherein the receiving, the removing, the completing and the transmitting are performed by an egress-FE (col. 14, lines 39-64).

Claim Rejections - 35 USC § 103

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2616

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. Claims 11, 12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prince et al. (USPN 5,852,606), of record.

25. Regarding claims 11, 12, 14, and 15, Prince discloses a method to calculate a routing table comprising: determining the routing table from at least one routing update message (col. 6, lines 6-11).

Prince does not expressly disclose altering the routing table for each of a plurality of forwarding elements in the router in reference to presence of an egress-port in the forwarding element; adding a switch-label corresponding to an actual egress interface to the table, when an egress-port is not present in the forwarding element, wherein the switch-label is unique for every port/next-hop pair on the router; and performing no altering of the routing table for a forwarding element, when an egress-port is present in the forwarding element. However, Prince does disclose that switch labels (routing tags) are only used when the egress-port is not present in the forwarding element such that they are not used when the egress-port is on the forwarding element (col. 14, lines 40-45). In addition, Prince discloses that each forwarding element has a routing table (col. 9, line 57-col. 10, line 8) and that this table is updated (col. 6, lines 6-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to altering the routing table for each of a plurality of forwarding elements in the router in reference to presence of an egress-port in the forwarding element by adding a switch-label corresponding to an actual egress interface to the table, when an egress-port is not present in the forwarding element, wherein the switch-label is unique for every port/next-hop pair on the router and by performing no altering of the routing table for a forwarding element, when an egress-port

Art Unit: 2616

is present in the forwarding element in order to ensure that the routing table reflects the updated list of routing tags.

26. Claims 22-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Andersson et al. (USPN 6,449,275), of record.

27. Regarding claims 22 and 25, Applicant admits as prior art a system comprising: a plurality of forwarding elements coupled to a switched interconnect/backplane (page 1, line 17-page 2, line 25), each of the forwarding elements to maintain a route lookup table to contain addresses associated with the packets entering the forwarding elements (page 1, line 17-page 2, line 25), and a control element operably coupled to the plurality of forwarding elements (page 1, line 17-page 2, line 25).

Applicant does not admit as prior art a switch-label entry table in each of the forwarding elements containing labels associated with the packets transferred internally among the forwarding elements via the switched interconnect/backplane, wherein the labels associated with the packets are generated before the packets are transferred internally through the switched interconnect/backplane or a control element operably coupled through a switched interconnect/backplane to the plurality of forwarding elements further comprising a processor and software means operative on the processor for generating a switch-label table for each forwarding element. Andersson teaches, in a modular routing system, having a switch-label entry table in each of the forwarding elements containing labels associated with the packets transferred internally among the forwarding elements via the switched interconnect/backplane (col. 3, lines 17-38), wherein the labels associated with the packets are generated before the packets are transferred internally through the switched interconnect/backplane (col. 3, lines 17-38) in order

to reduce the number of internal control paths required (col. 3, lines 60-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have a switch-label entry table in each of the forwarding elements containing labels associated with the packets transferred internally among the forwarding elements via the switched interconnect/backplane, wherein the labels associated with the packets are generated before the packets are transferred internally through the switched interconnect/backplane in order to reduce the number of internal control paths required.

In addition, Andersson teaches having a control element (connection setup manager) operably coupled through a switched interconnect/backplane to the plurality of forwarding elements (col. 3, lines 15-38) where the control element further comprises a processor and software means operative on the processor for generating a switch-label table for each forwarding element (col. 3, lines 15-38) in order to reduce the number of internal control paths required (col. 3, lines 60-63). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have a control element operably coupled through a switched interconnect/backplane to the plurality of forwarding elements further comprising a processor and software means operative on the processor for generating a switch-label table for each forwarding element in order to reduce the number of internal control paths required.

28. Regarding claims 23 and 26, AAPA in view of Andersson discloses that one of the forwarding elements further comprises an egress forwarding element and another one of the forwarding elements further comprises an ingress forwarding element (AAPA: page 1, line 17-page 2, line 25), which receives packets from an external networking environment (AAPA: page 1, line 17-page 2, line 25), generates a local switch-label and associates the switch label with the

Art Unit: 2616

packet (Andersson: col. 3, lines 15-38), the ingress forwarding element further comprises a packet forwarding component that forwards the packet through the apparatus using the switch-label (Andersson: col. 3, lines 15-38).

29. Regarding claims 24, 27, and 28, AAPA in view of Andersson suggests that the ingress forwarding element further validates the packet header checksum, decrements the time-to-live indicator by one, and recalculates the header checksum (AAPA: page 1, line 17-page 2, line 25 where it is implicit that the TTL is decremented by one).

30. Regarding claim 29, AAPA in view of Andersson discloses that the control element further comprises a route table manager that maintains a routing table (Andersson: col. 3, lines 15-38).

31. Regarding claim 30, AAPA in view of Andersson discloses that the apparatus is a router (AAPA: page 1, line 17-page 2, line 25).

Allowable Subject Matter

32. Claims 1-3, 5, 6, and 8 are allowed. The prior art does not disclose or fairly suggest performing the validating, decrementing, recalculating, forwarding, and look-up steps only once during transfer and performing the steps before the packet is transferred to a backplane.

Conclusion

33. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 2616

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (571)272-3152. The examiner can normally be reached on Mon.-Fri. 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571)272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Daniel J Ryman
Examiner
Art Unit 2616

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